CLAIMS:

1.   A method of processing a degraded speech input signal; the method including:
   - receiving the degraded speech input signal;
   - estimating a condition, such as the signal-to-noise ratio or bandwidth, of the received input signal;
   - selecting a processing model corresponding to the estimated signal condition;
   - estimating an originally uttered speech signal based on the received input signal;
   - processing the estimated original signal according to the selected model; and
   - outputting a processing result.

2.   The method as claimed in claim 1, wherein the step of estimating the originally uttered speech signal includes determining a most likely uttered speech signal given a predetermined processing model.

3.   The method as claimed in claim 2, wherein the predetermined processing model is a processing model selected as corresponding to the estimated signal condition.

4.   The method as claimed in claim 3, wherein the method includes iteratively:
   - performing a new estimate of the signal condition of the received input signal;
   - selecting a processing model corresponding to the newly estimated signal condition;
   - estimating an originally uttered speech signal based on the estimated original signal of an immediately preceding iteration given the selected processing model;
   - processing the estimated original signal according to the selected model; and terminating the iteration when a predetermined condition is met.

5.   The method as claimed in claim 4, wherein the iteration is terminated if a processing result no longer improves.

6.   The method as claimed in claim 4, wherein performing a new estimate of the signal condition includes selecting a more degraded signal condition.

7.   A method as claimed in claim 1, wherein the speech processing involves recognizing speech and the processing model is a speech recognition model.

8.   A method as claimed in claim 1, wherein the speech processing involves coding speech and the processing model is a speech codebook/encoder.

9.   A speech processing system for processing a degraded speech input signal; the system including:

   - an input for receiving the degraded speech input signal;
   - means for estimating a condition, such as the signal-to-noise ratio or bandwidth, of the received input signal;
   - means for selecting a processing model corresponding to the estimated signal condition;
   - means for estimating an originally uttered speech signal based on the received input signal;
   - means for processing the estimated original signal according to the selected model; and
   - an output for outputting a processing result.

10.   The method as claimed in claim 1, the method including generating the processing model by divergence-based model separation for discriminative training of a given model; the separation including:

   - estimating a divergence-based discriminant function; and
   - performing an adaptive learning step for model parameters based on minimizing a function of error rate.

11.   The method as claimed in claim 1, wherein the discriminant function is directly obtained from the relative divergence instead of being driven by input speech data.